

B7  
cont.

61. Device according to claim 57, wherein the flow rate of said inert gas or steam is from about 0.5% to about 3.0% by weight of the flow rate of the wort.

62. Device according to claim 57, further comprising filler bodies positioned above said bottom plate, said filler bodies increasing the surface area of contact within the column between the wort and the current of steam or inert gas.--

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REMARKS

Re-examination and favorable reconsideration in light of the above amendments and the following comments are respectfully requested.

Claims 28 - 52 are pending in the application. Currently, none of the claims stands allowed.

By the present amendment, claims 28, 32, 33, 35 - 38, 40, 42, 45, 47, and 50 - 52 have been amended; claims 29 - 31 and 34 have been cancelled; and new claims 53 - 62 have been added to the application.

In the office action mailed September 29, 1999, the Examiner rejected claims 28 - 52 under 35 U.S.C. 112, second paragraph as being indefinite. The Examiner

additionally rejected claims 28 - 50 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,933,953 to Leva in view of U.S. Patent No. 5,645,953 to McNulty et al., U.S. Patent No. 5,387,377 to Chuang, and the Handbook of Brewing by Hardwick, pages 294 - 299.

Further, claims 51 and 52 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,550,029 to Kruger et al. in view of Leva in view of McNulty et al. in view of Chuang and in view of Hardwick.

The foregoing rejections are respectfully traversed by the present amendment.

The present invention relates to a device and a method for eliminating unwanted volatile components from beer wort. The device comprises a counter-current contact column for permitting contact between an ascending current of steam or inert gas and a descending current of wort at a temperature substantially equal to the boiling point of the wort at the pressure in the column. The column contains filler bodies to increase the surface area of contact within the column between the wort and the current of steam or inert gas. The device further comprises means for feeding and uniformly distributing the beer wort into the column. The feeding and uniformly distributing means is located in the top part of the column and comprises a

distribution plate substantially perpendicular to a longitudinal axis of the column. The distribution plate is disposed under a wort feed into the column at the level of the top part of the column and includes first means for uniform flow of the wort in the descending direction and second means for flow of the current of inert gas or steam in the ascending direction. The first means for uniform flow of the wort comprises a plurality of orifices in the distribution plate. The second means for flow of the current of inert gas or steam comprises a plurality of chimneys on a surface of the distribution plate. The plurality of orifices in the distribution plate are sufficient in number and diameter to allow a predetermined flow rate of the wort, to provide a depth of the wort on top of the plate, and to prevent the passage of steam or inert gas through the orifices. The device further comprises means for feeding and uniformly distributing the current of steam or inert gas inside the column. This means is located in the bottom part of the column and comprises a bottom plate arranged substantially perpendicular to the longitudinal axis of the column. The bottom plate has means for increasing the surface area of contact, which means comprises a number of orifices such that a total surface area through which the current of

inert gas or steam passes upwardly and the current of wort passes downwardly is equal to at least 90% of a transverse surface area of the column.

With respect to the indefiniteness rejection made by the Examiner, appropriate amendments have been made to the claims to eliminate same. The Examiner is hereby requested to withdraw this rejection.

With respect to the rejections of claims 28 - 50 on obviousness grounds, it is submitted that none of the cited and applied prior art teach or suggest the subject matter of amended claim 28.

Amended claim 28 discloses a device for treating beer wort with steam or inert gas in a counter-flow gas/liquid contacting column. The column comprises a top distribution plate and a bottom plate. The top plate has a plurality of orifices which are arranged so as to allow a predetermined flow rate of wort while preventing the passage of steam therethrough. This is a condition necessary for preventing foaming of the wort at the level of the top plate. None of the cited and applied references teach providing a distribution plate with such an arrangement of orifices. The device further comprises a bottom plate having a plurality of orifices which are arranged so as to allow a total surface area for the passage of steam or inert gas

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equal to at least 90% of the transverse surface area of the column. This also is a condition necessary for preventing foaming of the wort at the level of the bottom plate. None of the cited and applied references teach or suggest providing a bottom plate with such orifices.

Particularly with respect to the Chuang patent, this reference teaches away from the subject matter of amended claim 28 since it specifies, from column 3, line 62 to column 4, line 1 and from column 4, line 21 to column 5, line 25, that frothing must be organized. In particular, Chuang states, in column 3, lines 64-68, that "[i]t has been discovered that significant benefit can be derived from developing a significant froth height in the packing above the respective tray." In view of the high tendency of hot wort foaming or frothing, it is impossible to use the teaching of Chuang for eliminating unwanted volatile components from beer wort. The Chuang patent would dissuade one skilled in the art from considering the possibility of an efficient beer treatment with packed bodies.

Similarly, the McNulty et al. patent teaches away from amended claim 28. McNulty et al.'s device, with the chimney hats arranged above the chimney, will strongly perturbate the ascending current of steam and the

descending current of wort, thereby creating horizontal velocity components which would generate much frothing and very irregular liquid/gas contact conditions. Following the teachings of Chuang or McNulty et al. would lead one to a low flow rate of wort and poor DMS elimination. As mentioned in the instant application, see page 4, lines 20-24, the device set forth in amended claim 28 allows the elimination of much more DMS than is possible with prior art technologies.

With respect to the propriety of the 103 rejection made by the Examiner, it seems that the Examiner has failed to set forth a proper case of obviousness. (First, the Examiner pays no attention to the fact that Applicant's device is for treating beer wort, None of the principal references relied upon by the Examiner are directed toward the treatment of beer wort. It is error for the Examiner to ignore this aspect of the claimed invention since much of the structure set forth in claim 28 and its dependent claims is specifically directed to the treatment of a beer wort to eliminate the unwanted volatile compounds. In particular, the distribution plate at the top of the column and the bottom plate at the bottom of the column are intended to prevent foaming of the wort at those levels.

This is something which is not addressed in any of the cited and applied references.

With regard to the combination of the references, it is well settled patent law that to establish a prima facie case of obviousness based on a combination of the content of various references, there must be some teaching, suggestion or motivation in the prior art to make the specific combination that was made by the Applicant. In re Raynes, 7 F.3d 1037, 1039, 28 USPQ 2d 1630, 1631 (Fed. Cir. 1993). Obviousness cannot be established by hindsight combinations to produce the claimed invention. In re Gorman, 933 F.2d 982, 986, 18 USPQ 2d 1885, 1888 (Fed. Cir. 1991).

Nowhere in the rejection does the Examiner identify those specific teachings which would motivate one of ordinary skill in the art to combine the references in the manner suggested by the Examiner. The mere fact that individual components of an overall combination may be found in the prior art does not mean that it would be apparent to one of ordinary skill in the art to combine them. The best example of the hindsight nature of the rejection made by the Examiner is the incorporation of the Hardwick reference into the combination. Since Leva, McNulty et al., and Chuang are not directed to the

processing of a beer wort, there is absolutely no reason to incorporate a teaching that relates to cleaning brewing kettles into any of their structures. It is submitted that the only reason that the Examiner has incorporated Hardwick into this rejection is because Applicant, in a dependent claim, calls for a cleaning means. This also shows a "shotgun" nature of the rejection made by the Examiner.

Still further, many of the features of the dependent claims set forth in the application are not taught or suggested by the cited and applied references. In fact, they are not even discussed in the rejection. For example, there is no teaching or suggestion in the references of providing the chimneys with a height so that the wort on top of the distribution plate cannot flow through the chimneys when the column is operating (claim 22). There is also no teaching or suggestion of forming a diffuse array of stacked rings as set forth in claim 23; of providing the bottom plate with corrugations as set forth in claim 35; of providing the main and secondary pipes with the claimed orifices of claims 37 and 53; or of providing the inclined surface and baffle of claim 40.

For these reasons, claim 28 and its dependent claims are believed to be allowable. The Examiner is hereby



requested to withdraw the obviousness rejection of claims 28 - 50.

With respect to claims 51 and 52, these claims have been amended to be directed to a method of eliminating unwanted volatile components from beer wort. It is submitted that none of the cited and applied references teach or suggest the boiling step and the separating step set forth in claim 51. It is further submitted that none of the cited and applied references teach or suggest controlling the internal pressure in the column in accordance with the temperature of the wort entering the column as set forth in claim 52. While the Kruger et al. patent is directed to the treatment of a wort using a counterflow arrangement, it lacks many of the features of the claimed method step. The deficiencies of Kruger et al. are not overcome by the McNulty et al., Leva, and Chuang patents since none of these patents are directed to the treatment of a beer wort. Similarly, none of these deficiencies are overcome by Hardwick since Hardwick is merely cited for the purposes of showing a "clean-in-place" means which are not called for in amended claims 51 and 52.

New claims 53 - 56 are believed to be allowable for the same reasons that claim 28 is allowable as well as on their own accord.

New claims 57 - 62 are believed to be allowable for the reasons previously advanced. In particular, none of the cited and applied references teach or suggest a means for collecting the wort which includes means for avoiding any significant formation of foam.

With regard to the objection to the drawings raised by the Examiner in the office action, it is submitted that the means "adapted to distribute regularly and uniformly the current of steam or inert gas over all of the transverse surface area of the column" (claim 28) is already shown in the drawings. Please see reference numeral 10 in Figure 1 and the pipe construction of Figure 5. With respect to the cleaning means of claims 41 and 42, Figure 1 has been amended to show these cleaning means. The Examiner is hereby requested to approve the amendment to Figure 1. In light of the amendment to Figure 1, it is necessary to add reference numerals to page 11 of the instant application. Such reference numerals have been added.

There being no further objections or rejections, it is submitted that this case is now in condition for allowance. Such allowance is respectfully solicited.

Should the Examiner believe an additional amendment is needed to place the case in condition for allowance, he is

invited to contact Applicant's attorney at the telephone number listed below.

A request for a three month extension of time is enclosed herewith along with a check in the amount of \$978.00 to cover the extension of time fee and the additional claim fee. Should the Commissioner determine that an additional fee is due, he is hereby authorized to charge said fee to Deposit Account No. 02-0184.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231

on March 29, 2000  
(Date of Deposit)

Nicole Porto

Name and Reg. No. of Attorney

Michael Pat

Signature

March 29, 2000

Date of Signature

Respectfully submitted,

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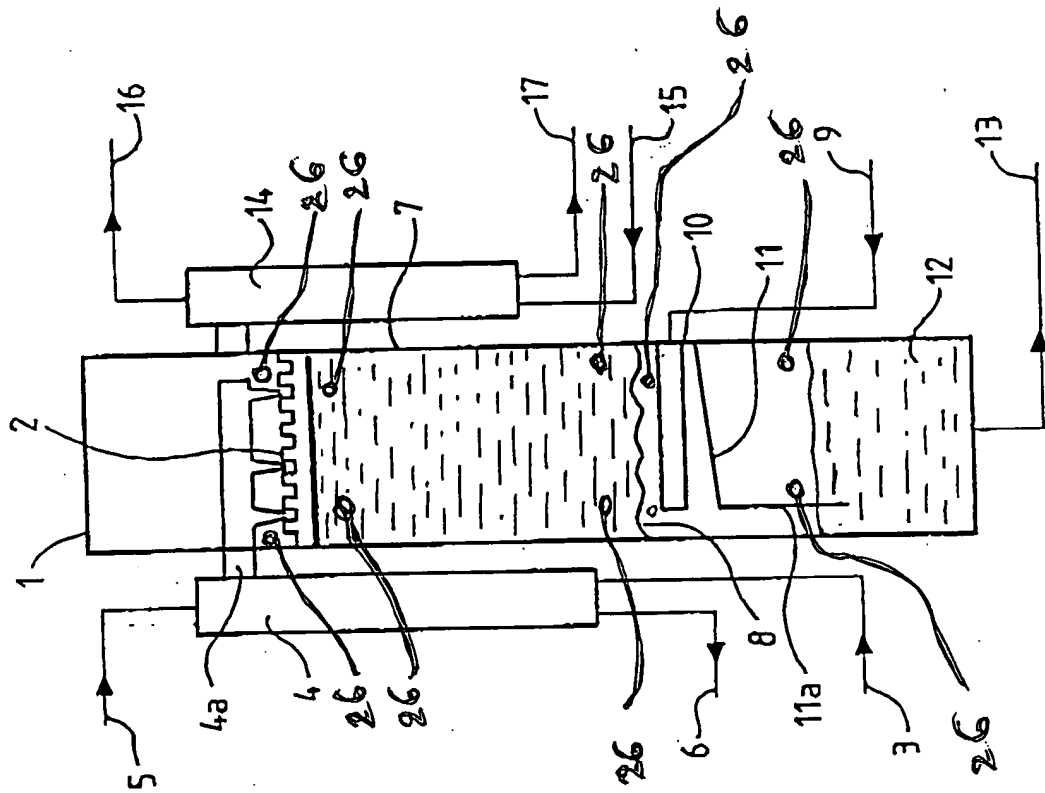


FIG-1